VOLUME 2 - NO. 9 DECEMBER 1994

The Low Band Monitor

December - Circuit

Low Band Propagation has finally started to reach it's true potential this month:

- On December 2, **AJ6T**, works **9M8FC** on 160 meters past his sunrise at 1456 UTC.
- On December 3, **N7MC** works **XU7VK** with a booming signal on 3.506 Mz from Cambodia.
- On December 4, Bill, **K0HA** worked **VQ9QM** at 2337 UTC on 3.513 mz. from Nebraska.
- On December 9, Randy, **WB9Z**, found **A35RK** on 1.827 mz. for a new country on top band. **N7MC** also bags **JT1BR** on 3.794.mz.
- On December 10. Price, **W0RI**, had a fine run of eleven Europeans, including **9A2TW** on 160 meters and **6W6JX**.
- On December 11, Al, **W8AH**, worked **A61AN** on 75 meter SSB at 0031 UTC. **W1WAI** worked **7P8SR** for #248 on 3.522 mz.

These were interesting developments, but were only a prelude to one of the best back-to-back propagation days experienced in years. If you were on 160 meters on December 17-18 you know that:

- Swedish stations, **SM5EDX**, **SM4CAN** and **SM6CPY** were audible on 160 meters from 0100 to 0800 UTC.
- Most Western European countries were workable with French, English and German stations being heard in quantity.
- These 160 meter openings were so robust that European stations like **GM3BQA**, **F5LGE**, **CT1ESV**, **F6BKI** and **EA8PP** were worked easily on SSB above 1.840 mz. from the Midwest. Jim, **GM3BQA**, was solid Q5 copy on SSB as late as 0840 UTC.
- On December 18, John, **ON4UN** worked at least 40 stations in the U.S. W6 and W7 Districts. **AJ6T** made it with 100 watts and received a 599 report from John!
- Jerry, **NX0I**, from Missouri, worked nine new countries during this two day period. A station in Montana reported 21 European stations worked on SSB!
- Bill, **K0HA**, made 43 European contacts on 160 meters on the 18th of December alone. He notes that there was also a 10 minute opening to some stations in Eastern Europe during his sunset period (2345 UTC) on this day, but that the 19th's 160 meter propagation did not develop.

We Earned This One

After month's of patient listening on top band with six minute 339 openings to Europe, it was nice to experience a real band opening this month. Conditions have dropped off a bit since the 17th and 18th, but the memories of these two great operating nights will keep many of the faithful's batteries charged for months.

The effect these 160 meters openings have on the 40 and 80 meter bands is interesting. You know that there is some enhancement, but how do you get a station like **YO3APJ** to QSY from 1.827 mz. to 3.505 mz. when you need him on 80 meters for a new one? These are problems I like!

The spots this month have been filtered severely. For the first time ever on 160 meters, I deleted most stations from France, England and Germany. **F5IN, F5LGE, F6BKI, F6GSM, DJ6RX, DK7SU, DL5XU** and all the G stations; you were in there, but I simply ran out of Power Spot™ space!

The CQWWCW

Those of you that participated in this late November event know that propagation was quite favorable on the first night and then dropped off substantially on the second. A few of our subscribers were kind enough to send in a few scores of note:

- **K0HA** managed of 41 countries on 160 meters including 28 European stations from Nebraska.
- **W8UVZ** had 49 countries and 17 zones on 160 meters from the state of Michigan.
- **KX4R** had 43 countries and 16 zones in a limited time 160 meter effort during the contest.

The CW weekend event was certainly not optimum, but it provided much more low band DX opportunity than the SSB weekend in October.

Pacific Activity

During a conversation with Bill, **W7TVK**, of Nevada I found out that **A35RK** was on 160 meters every morning during our sunrise period. Bill even sent my call one morning on **A35 RK**'s frequency and all I heard was dead air. This station has been worked as far inland as **WB9Z** in Illinois. The signal from **5W1MM** is similar to this one. Look for both stations and be ready - the copy will be of very short duration.

The YK0A Operation

The low band activity for the **YK0A** operation on the low bands went as expected, with the following continental breakdown:

CONTINENT	160M	80M	40M
N. America	15	189	995
S. America	0	3	50
Europe	419	1860	3302
Asia	35	156	642
Africa	1	4	19
Oceania	0	0	7
TOTAL	**470**	**2212**	**5015**

TNX: NI6T

I have asked **W6OAT** to send us a copy of the 160 meter logs. The QSL's for this fascinating operation are already in the hands of the deserving. This group did a fantastic job from one of the rarest DXCC countries. Also look for **YK1AO** on 40 meters at your sunrise.

80 Meter Long Path

Our local 80 meter long path specialist, Eric, **K0KE**, reports the following comparison between 1993 and 1994 through December 25:

LONGPATH	1993	1994
80 Meters	34 QSO's	85 QSO's

Eric uses a very effective 4-Square on 80 meters and notes that a number of Northern European stations are audible on the short path this season (12) versus last year (4). His long path countries this year through Christmas as follows: SM - 35, OH - 21, LA - 4, UN - 3, UA - 2, HZ - 2, ES - 2, 4K - 1, 3B8 - 1, UT - 1, and LY - 1.

In This Issue

- Don't tell your DX friends about the *ZJ Electronics - Beverage Box*. Just buy one for yourself and mess their minds! I have 21 new 160 meter countries (101) since trying this device. Yes - I like this product!
- If you want to review Beverage toroid tranformers, **KY0A** has some very good observations that might surprise you.

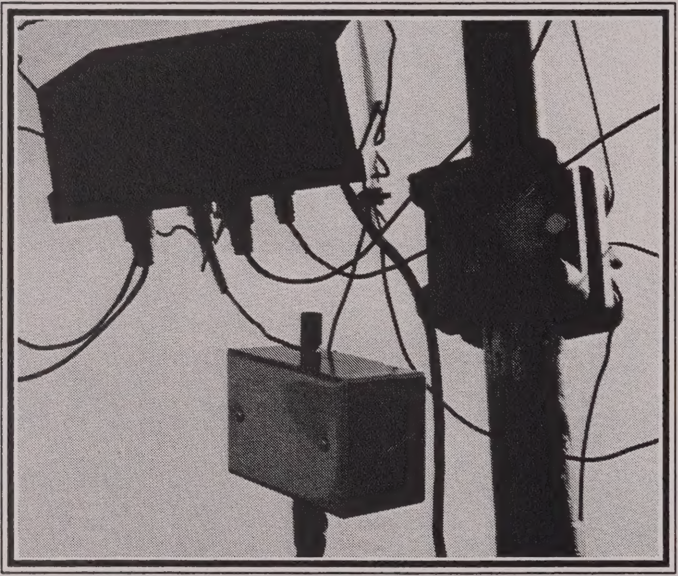
Lance Johnson - Editor

ZJ Electronics - Beverage Box

Q5 Copy on 80 and 160 Meters Will Change Your Attitude - by K0CS

Editor's note: The editor had an opportunity to try the ZJ Electronics Beverage Box for a 30 day period on his "real world" Beverage system. Readers who have constructed or are thinking of constructing a Beverage antenna should read this article carefully.

Background - I currently have 5 Beverage antennas on my 5 acre lot that are switchable in various strategic directions from an *Ameritron* RCS-8 Coax Switch Box. This *Ameritron* box is the model that uses a separate 6 conductor control cable. The Beverages are terminated with 470 ohm resistors and vary in length from 250 - 500 feet. A home made 9:1 transformer is used to match the Beverages to the receiver.



ZJ Electronics Beverage Box mounted in Series with the Ameritron RCS-8 Coax Switch Box. Both units are "floating" off the mounting hub to reduce vibration caused by wind.

This Beverage system is not optimum - but it is the best I can do on my lot. One of my Beverages runs past a 90 foot tower. Another Beverage passes right through an 80 meter Delta loop. Another Beverage terminates near a two-car garage. This is what we mean by the term "real world".

My listening capability is certainly better than the local stations who are on a small suburban lot trying to hear on their transmit antennas, but hearing performance (particularly on 160 meters) is significantly down from other Colorado stations like KV0Q, K0RF, AA6TT and KY0A who have "Ponderosa" style properties and Beverages with lengths in excess of 1,000 feet.

Being relatively new to the 160 meter band (80 countries confirmed), I was certainly interested in trying the *ZJ Electronics Beverage Box.* Anything that would help my hearing capability on 160 meters would be welcome.

Remote Receiving Antenna Use - On a Beverage antenna, you use one antenna (I use a single 1/4 wave vertical with elevated radials) for transmit and another (the Beverages) for receive. This is accomplished by utilizing your rig's accessory jack or #2 antenna connector at the back of your transceiver.

Don't even think about using a manual coax switch when using the *Beverage Box* system or any Beverage antenna. In the heat of the DX hunt you will forget to switch to your transmit antenna and fry the *Beverage Box* circuitry with your transmit power.

Spend a few minutes and review remote antenna hook up in your transceiver's owners manual before attempting operation. I have included the remote antenna configuration used by the Kenwood TS-930S, that is fairly typical for modern transceivers.

Installation - The *Beverage Box* is made up of three basic components:

1. Remote Preamp/Transformer/Filter Box - The heart of the system. This weatherproof unit mounts outside at the Beverage feedpoint or hub.
2. Coax Connector Box - This is a small metal box that utilizes two SO-239 connectors for connecting the Beverage coax in the shack.
3. Power Adapter - A standard 9 volt DC adapter powers the unit's preamp.

My first task was to find 500 feet of control cable to run out to the *Beverage Box.* Then I looked at the instructions for the unit. The *Beverage Box* does **not** require any control cable! The unit's voltage is supplied through the coax!

What I thought was a control cable connector was actually the mounting hardware used for placement on a ground rod. At this point I removed my original 9:1 transformer box from the *Ameritron* RCS-8 and inserted the *Beverage Box* in series with the *Ameritron* and then connected a ground wire to the box.

Note that my remote switch box and Beverage Box have been removed from the mounting bracket on my Beverage hub and are supported by wires in sort of a nesting orientation. One evening while tracking noise I discovered that my five rather taut Beverage wires and a still "ghost" wind set up a vibration at the hub that was extrordinary. The solution, although messy, was to isolate the coax switch and matching transformer apparatus from the pole by floating them as shown in the photo.

The hook up in the shack was even easier. You connect a couple of coax connectors and plug in the power adapter. *ZJ Electronics* has pre-wired the two in-shack components so the device is truly Plug-and-Play. The total installation time for the unit, including the 500 foot walk to my Beverage hub was 20 minutes.

Initial Operation and Concerns - My first 160 meter listening session with the *Beverage Box* was about an hour before sunset. This was very interesting, as I could hear many East Coast stations on the band that I normally could not hear in daylight. This is intriguing, but listening to W0ZV, VE1ZZ and K1ZM work YO stations at 2230 UTC is not what I want from a Beverage system.

My next concern was the performance of the unit's Highpass Filter. Commercial station KOA has a 50 KW transmitter located 15 miles away that puts birdies on 1.820, 1.830 and 1.840 mz. that can be quite devastating. I found that all of the birdies were literally gone with the *Beverage Box. Note: A few days later I actually made a DX QSO right on 1.830 mz - a first for me!*

The next test was to attempt to overload the *Beverage Box* 10 db. Pre-Amplifier while a strong local station was on the band. Bill, KV0Q, who is 9 miles away, came on with his 160 meter 4-Square and his signal did not affect the pre-amplifiers performance. Later, Charlie, KY0A, who is 15 miles away, came on and again no overload occurred.

ZJ Electronics Beverage Box Plug and Play components. Coax Connector Box (for Beverage and Transceiver) and the 8.5 volt Power Adapter.

Even though my receive antenna is grounded during my transmit mode, I was curious about the effect the RF from my 160 meter 1/4 wave vertical and 80 and 75 meter Delta Loops would have on the *Beverage Box* Pre-Amplifier. As expected there was no noticable effect on the unit after transmit.

Initially, I was concerned that the receive signal would be noisy due to the *Beverage Box* Pre-Amplifier voltage (8.5 VDC) being on the feedline. This was not the case - the pre-amplifier enhances the signal in a manner that will change your outlook on the 80 and 160 meter bands.

Long Term Operation - During the test period I found that the *Beverage Box* had the ability to make marginal 160 meter signals Q5. The most impressive scenario is when you are carefully tuning a quiet band. The pre-amp helped sense a wispy signal one morning with the Western Beverage selected. Changing to the Northwest Beverage the signal improved. As a lark, I went to the Southwest Beverage and the signal went to a nice 559 - UA0FDX was worked for a new one. I was originally on the wrong antenna, but the ability to hear remnants of a signal with the pre-amplifier on can often put the listener in the right direction.

Operation on the 80 meter band, where I have fewer country needs, is also excellent. My "real world" Beverages also tend to work better on 80 meters.The *Beverage Box* is not optimized for 40 meters, but I usually use a two element 40 meter yagi for receive on this band.

During the evaluation, my 160 meter country total increased by 11 countries (now 91) in a month's time. This is the same number of new countries I worked on 160 meters in the past 12 months. The *Beverage Box* consistently took the 160 meter DX signal from the "marginal copy" category (this is called being exposed) to the "I can work this one" category.

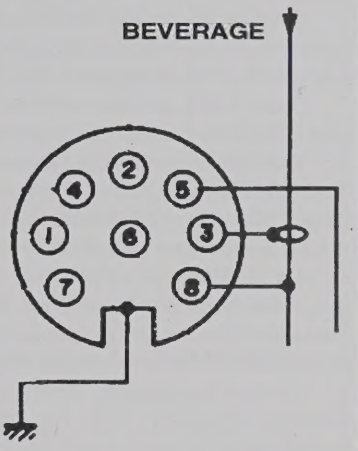
I had been in a bit of a low band DX slump before trying the *Beverage Box*. Today, my enthusiasm is up and I feel that I am back in the game.

The best new country catches on 160 meters were VS6WO, KH0AM and A22MN. This is garden variety DX for some people, but this is fairly rare 160 meter DX for Colorado. There were a few times where I would hear DX stations that I had worked before calling CQ and stateside stations would unknowingly call CQ right on top of the DX station.

I certainly won't be challenging stations like K1ZM, VE1ZZ and W0ZV this year on the 160 meter band DXCC list, but with the addition of the *Beverage Box* I have a chance at making 160 meter DXCC before the Dayton Hamvention™ in April.

The Kenwood TS-930S utilizes the Transverter Jack for a Receiving Antenna. You can wire directly to pin #5 (RCVE INPUT) and ground for dedicated Beverage receive only.

TYPICAL BEVERAGE HOOK UP



Or wire pin #8 (HF ANT OUTPUT) through a SPDT switch for receive access to the transmit antenna

Remote (Beverage) Antenna hook-up for the now vintage Kenwood TS-930S transceiver. Refer to your transceiver's Owners Manual when using the Beverage Box.

The *Beverage Box* won't open up a dead band, it won't cure power line noise, it won't stop QRM, but it will make most weak 80 and 160 meter signals workable with a "real world" Beverage system. I can only speculate on what this device would do with optimized Beverage lengths on pristine terrain, free of power line poles, towers, garages, antennas and barbed wire fence.

Conclusion - I recommend this product to anyone who has a Beverage system. The remote box is weatherproof and contains a double sided, glass epoxy, plated through hole PC board. After testing and assembly by *ZJ Electronics*, the board is sprayed with a poly-urethane compound that provides a moisture barrier on the board and components.

The excellent performance on 80 and 160 meters can be attributed to the well conceived design and the placement of the 10 db. Pre-Amplifier at the Beverage(s) rather than in the shack.

Experimenters and people on smaller lots are advised that the *Beverage Box* can be used on other receiving antennas that have a characteristic impedance of 450 ohms and are to be used on the 80 and 160 meter bands.

Call *ZJ Electronics* for the current pricing of this great low band product. You can't have mine!

Contact: *ZJ Electronics*, 6893 Peck Road, Syracuse, NY 13209, (315) 635-7148 (2100 - 0200 Z) for additional information and ordering details.

The Second Season - Month Four

AB6ZV, VE7SZ, KV0Q, K0IJL, K8EJ, JH1GNU, NI6T, KX4R. AB0X, NX0I and AB6LJ

Forty Meters - There were no new submissions for this very challenging award this month, but Merv, Jeff and Tom are all going for the 200 country level for the 1994 - 1995 season. These guys are good!

Eighty Meters - Rich, AB6ZV, coming off a major effort in the CQWWDX Test, joins the 80 Meter group in the #5 position. Rich was the last entrant to make the list in less than three months of operating.

Allan, VE7SZ, becomes the first Canadian to make the 80 Meter listing as #6. He has a 2 Element M- Square yagi at 140' to help with the generally benign propagation conditions from British Columbia.

Danny, AB6LJ, comes in at #7 for this season. His one hundredth contact came long path with SM2EKM.

Shigeru, JH1GNU, made history as #8. He is the first station from Japan to make our seasonal listing. His work schedule delayed his start by over a month, but he and his 80 meter fishing pole recovered very well.

Garry, NI6T, qualifies as #9 for this season. He is the fifth station from California to make this 80 meter listing.

The document quality of these submissions was impressive. Each of these individuals utilized various types of computer software, that makes the record keeping straight forward. Some of the logs even document the exact frequency used to work the station. Thank you gentlemen!

On the next page we will look at the 80 meter logs of four stations from different geographic regions. K9FD, W6RJ, N4KG and JH1GNU were selected so readers can get a feel for what each of these DXers had to do to achieve the one-hundred country level on the 80 meter band.

Look at the country distribution by continent and DX contact distribution by SSB vs. CW. This should help your 80 meter strategy.

One Hundred Sixty Meters - Bill, KV0Q joins the listing at the #10 position. Bill utilizes a 160 meter 4-Square and is one of the West's best top band stations. He has also competed with distinction on the 40 meter band in the CQWWCW.

John, K0IJL, joins the listing at position #11. He utilized an Alpha Delta Sloper at the 90' level to complete the journey. Let us know John if you get a QSL from 6W6JX - nobody else has!

Steve, K8EJ, checks in at #12 on top band. He missed the CQWW Phone that probably set him back a month. Steve is correct, the phone contest was poor, but at least we all had opportunities to work South America. The 160 meter award is definately *not* trivial this season!

Greg, KX4R, got free from his busy work schedule to qualify for #13 and made the grade in less than three months.

Mike, AB0X, the first station from Kansas to qualify, gets listing position #14. Mike utilizes a shunt fed tower and various loop antennas for receive from his suburban location. He made it in less than 30 days.

Jerry, NX0I, is plagued by a work schedule that eliminates his sunrise top band openings to Asia and Oceania. He worked a tough A35RK to get Oceania and qualify for #15 on 160 meters.

General - Don't be shy, send us a copy of your log data for any of the free awards. The awards not only show our readers which DXer's are getting the job done on the low bands, but they also help us all understand current propagation trends on these challenging frequencies.

There are some very fine operators on these listings. Our season began on September 1, 1994 and will end on April 1, 1995. There is still plenty of time for you to engineer an effort.

160 METER WORKED ALL CONTINENTS 1994-95

NO.	CALL	DATE	AFRICA	ASIA	EUROPE	N. AMER.	OCEANIA	S. AMER.
1	**W0ZV**	09-17-94	VQ9SS	4X4NJ	HB0/HB9NL	VE8HL	ZL2SQ	PT7BZ
2	**K1ZM**	09-18-94	S92SS	4X4NJ	SM5EDX	KA1PE	ZL2SQ	PP7JR
3	**K9FD**	09-29-94	D44BS	4X4NJ	R1FJL	AL7MX	VK2BJ	PY2BW
4	**WB9GYU**	10-26-94	S92SS	JA1CGM	JW5NM	XE2/AI7B	VK3OT	PT7BQ
5	**K0CS**	10-27-94	EA8PP	JA1HQT	CT1AOZ	W0ZV	5W1GC	WA3LRO/PJ4
6	**KY0A**	10-29-94	C56/G0MRF	JH0ZHQ	RZ6HW	VG3EJ	VK3OT	PJ1B
7	**W8UVZ**	11-13-94	Z21HS	JH1RES	SM5EDX	AL7MX	VK5BC	P40J
8	**N4KG**	11-14-94	DL3KUD/CT3	JA1CGM	CT1AOZ	CO1RH	VK3OT	8R1K
9	**K8GG**	11-15-94	S92SS	JH1RES	G3PQA	6D2X	VK5BC	PJ1B
10	**KV0Q**	10-28-94	C56/G0MRF	RZ6HW	LA2EG	VE2PR	VK6ABL	PT7BZ
11	**K0IJL**	12-11-94	6W6JX	JH1RES	9A2TW	CO2EG	ZL2SQ	P40W
12	**K8EJ**	12-10-94	S92SS	JH1RES	JW5NM	K8GG	VK5BC	HK7/SM5HV
13	**KX4R**	11-22-94	C56/G0MRF	JA1CGM	HB0/HB9HL	HP1XBH	KH6CC	P40W
14	**AB0X**	12-17-94	EA8PP	JA1HQT	G3ZFC	FM5BH	KH6CC	HC8N
15	**NX0I**	12-18-94	A22MN	JH1RES	EU6AF	TI2PZ	A35RK	HK6KKK

80 METER WORKED 100 COUNTRIES 1994-95

NO.	CALL	DATE	COUNTRY	STATE	SUBMITTED	LATEST
1	**K9FD**	10-15-94	USA	ILLINOIS	104	104
2	**W6RJ**	10-29-94	USA	CALIFORNIA	110	110
3	**N4KG**	11-03-94	USA	ALABAMA	100	114
4	**K6SSS**	11-13-94	USA	CALIFORNIA	100	140
5	**AB6ZV**	11-27-94	USA	CALIFORNIA	107	107
6	**VE7SZ**	12-03-94	CANADA	BRITISH COLUMBIA	100	100
7	**AB6LJ**	12-11-94	USA	CALIFORNIA	104	102
8	**JH1GNU**	12-01-94	JAPAN	HIRATSUKA	101	101
9	**NI6T**	12-19-94	USA	CALIFORNIA	100	100

40 METER WORKED 150 COUNTRIES 1994-95

NO.	CALL	DATE	COUNTRY	STATE	SUBMITTED	LATEST
1	**K9FD**	09-24-94	USA	ILLINOIS	154	161
2	**K0OD**	10-07-94	USA	MISSOURI	151	183
3	**N4KG**	11-02-94	USA	ALABAMA	152	161

80 METER ACHIEVERS - THE DX THEY WORKED

K9FD - ILLINOIS

WA4JID/C6A
HK4DHR
FM5DN
UA0FM
VR6BX
ZL3ABV
JH1HCG
N6VI/KH6
XE2KB
VK2FMB
J73LC
3D2ER
SM4AAH
V44KAA
P29RB
VP2EST
YV5AAX
5W0BL
CX4SS
T30BH
OZ7YY
HI8OMA
V73GT
PZ1DV
V63JC
JW0C
T77T
ZD8Z
KH8BB
I5VXG
F6DZU
PJ4/WA3LRO
G4AMN
EA1DLU
J88CR
VP8GAV
HP3FL
VP5JM
OK1BB
ZP5MGR
HK0ER
PJ7/OH2LVG
LU2BRG
CM8FM
R1FJL
PA0LEG
HH2PK
SV1EX
9A1A
KG4JO
N4CC
OS8RD
TI2LL
TK5BF
EA6MQ
K1EFI/VP9
6Y5AL
HR1LW
PU1ALH
EI4EE
GI4BGB
EW1WZ
9Y4SF
EA8CN
S53YZ
GD4GDN
TG9AJR
HC4L
FK8FU
LY2BZ
LX1UN
LZ2PP
OM5TD
FG5FC
CT1BVV
DK8ZB
V26Y
HA3HV
UT5UT
C31SG
4S7AG
HL9HH
YU1MW
A22MN
5Z4FO
HP1XBH
YJ0AAY
KH2F/KP4
8R1AK
EA9IE
I0GPY
OA3AB/1
FY5GJ
3DA0BK
CN8GI
CU9CNE
OE6MBG
G3TBK
SP7GV
CR9WAG

SSB: 61 PERCENT **CW:** 39 PERCENT

AFRICA - 08 ASIA - 04 EUROPE - 37

N. AMER. - 23 OCEANIA - 13 S. AMER. - 15

N4KG - ALABAMA

CO2PL
VP8GAV
VP2EST
YV1NX
HK0ER
HC7SK
CX1TM
VK3DZM
JH0ZHQ
5V7DB
OM5TD
V63JC
6Y5AL
HP1XBH
HR1LW
N2CQR/HI8
GD4VGN
NH6XM
FK8FU
9K2MU
KG4JO
EA7CEZ
HK4GQX
VR6BX
ZL1AIZ
YS1AG
EA8BYR
5W1MM
YJ0AAY
ZA1AJ
DL8KWS/CT3
JI7BCD/JD1
FR5DX
DL0UM
LZ1V
KG6VI
HL9HH
C21/DL6NA
FM5DN
N1ZZ/VP9
ZK1NA
5Z4FO
GM3POI
IT9PZM
8R1AK
EA9IE
G3PCG
PA0LOU
GW3KGV
7X5JF
GI4BGB
ON7GB
6E2Z
J68ER
PJ4/WA3LRO
TI2LL
KC6SS
FO/DJ1RL
V73GT
TK5EL
VP2V/WA2VUY
V26E
3DA0Z
FG5FC
9I30ZIN
ZS1JX
V5/WA0PUJ
S59A
ZF2LS
HA3HV
KP2AD
F5QF
T94P
LY2BZ
SM3BDZ
HB9ADD
SP9TCV
OK1WV
XF4M
EI8H
FS/KH8AL
WA4JID/C6A
V44NK
V31DX
PJ7/N0BSH
YU70F
9G5JR
VX3N
VP5R
KP4TN
J3A
J73LC
HC8A
4U49UN
5N0MVE
CE8EIO
LU4FM
TR8XX
SV5TS
9A2DS

SSB: 44 PERCENT **CW:** 56 PERCENT

AFRICA - 14 ASIA - 04 EUROPE - 26

N. AMER. - 29 OCEANIA - 15 S. AMER. - 12

W6RJ - CALIFORNIA

VP5JM
ZL2SN
VP8BKT
VK2FMB
FK8FU
OH9BVM
OH0BH
LA8SDA
SM3BDZ
ZD8Z
EA3NY
HI8OMA
DU6BG
JA3USA
LU8EEM
F5IN
CT4NH
G3NAS
5W1GC
XE2Z
T32O
YJ0AAY
BV7FF
HZ1AB
9M2AX
YB2UDH
HL2DNN
9M8DB
YS1AG
OM3KAG
6Y5RJ
FY5GJ
I3MAU
K6UA
YV4FJJ
JI8BCD/JD1
CR9WAG/CT3
A22EX
3X0DEX
EA8BYR
CE8EIO
TI2LL
HR2AES
VE7SV
RZ3AYO
KG4JO
CU9CNE
NH6XK
NL7GP
UA0CEB
XU7VK
UNYVV
3D2FT
HK0ER
V44KBT
N1ZZ/VP9
PZ1DT
DL5AXX
OE6MBG
FR/JO1OEM
CN8GI
XX9TSX
J73LC
HJ6SQQ
EX0V
3B8CF
S59AA
EY8MM
V63AO
V73GT
J68AG
KP4DEK
PJ7/KI4SN
FO5/DJ1RL
WA2VUY/VP2V
V26E
V5/WA0PUJ
ZF2LS
KP2AD
XF4M
C21/DJ1RL
P40E
HD9C
WA4JID/C6A
V31DX
FS/KH8AL
VP2EX
FG5FC
HC8A
4U49UN
5T5JC
8P6BU
A35ZB
CO1RG
EA9LK
ES7RE
FM5DN
GW4BLE
HP1XBH
J3A

SSB: 60 PERCENT **CW:** 40 PERCENT

AFRICA - 11 ASIA - 12 EUROPE - 17

N. AMER. - 33 OCEANIA - 18 S. AMER. - 09

JH1GNU - JAPAN

UA0QEU
XU7VK
V63KZ
EX8F
BV7FC
UT5EA
EY8AM
DJ5OP
SP2PMK
A71CW
RZ4WWB
YL2SM
LU8EEM
JE1SCJ
VK2BJ
JT1BR
N7EKD
VE7GDL
9M2AX
4K500CW
LZ2PP
OH2WI
4S7/JA4FM
ZL1AIZ
5W1GC
UN7FAZ
J28FD
9Q5AGD
UK8OO
SV2BOH
5U7Y
YJ0AAY
C21/DJ1RL
KH6CF
EA3JE
YU1ANO
OM3TZW
HA5LZ
EK4GW
JD1BIK
OK1NR
9A3GS
IV3DXW
9M6HF
9G1MR
FR/JA1OEM
N7ET/DU7
HL1DNN
LY2LZ
HB9AAD
SM4HCM
XX9TSW
4L1UN
JI7CDB/JD1
ZK1RLL
YO9AYN
3B8/JA1ELY
VK9NS
V73GT
JW7FD
KC6SS
T5AR
4Z4KX
PJ4/WA3LRO
J68AS
HK3HHX
FO/DJ1RL
FH/JA1ELY
6D2X
BY1QH
OE3OOW
5B4ADA
S58A
OH0F
EA8AH
FK8FU
EU3FT
YF8XM
5R8DP
KL7Y
ES6DO
UA2FEK
G4BVE
T92A
F5IN
HC1XM
S79TR
OZ8SS
YK0A
C6AHX
9X5EE
HS7AS
9V1ZB
ZS6QU
Z30A
T32BE
PY3JZ
ON4UN
4U1ITU
C31SD

SSB: 25 PERCENT **CW:** 75 PERCENT

AFRICA - 10 ASIA - 19 EUROPE - 52

N. AMER. - 05 OCEANIA - 10 S. AMER. - 04

LETTERS - LETTERS - LETTERS - LETTERS - LETTERS - LETTERS

Lance:

After reading your review of *Comtek System's* ACB-4 phased array system in the May 1994 *Low Band Monitor* I began looking into the system. Discussions with *Comtek's* new owner, Jim Miller, KF4HK, led to my purchase of a system for 80 meters. Construction of the array began in September and the system was up and running in plenty of time for the CQWW in late October. In short, the system has been nothing less than awesome. I configured the array as a completely elevated system. The tapered aluminum radiators are 44 feet tall and have three 27' wires at the 40' level for top loading. Each antenna has 4 elevated radials, approximately 67' long. Every effort was made to keep the radials level at 10' above ground. Tests against the other 80 meter antennas (vertically polarized loop at 90' and a dipole at 90') indicated that the array was significantly better on most DX signals. While I still use Beverage's on 80 meters to some degree, they are simply not necessary most of the time. In the CQWWSSB I was able to work 75 countries and 25 zones. In the CQWWCW I worked 86 countries and 27 zones. The array more than holds it's own in the pileups. Now maybe I'll get zones 23 and 26 and finish 5BWAZ!

The best part about this array is that the total cost was less than $800. I was also able to build and erect the system myself without the need for a crane or other heavy equipment. While I concede that my friends with 2 and 3 element yagis may have a 5 db. advantage on some of the higher angle paths to Southern Europe, the lower cost combined with the much simpler maintenance made the decision to go with a *Comtek* an easy one. An hour after the CQWWSSB my phone rang. It was Jim, wondering how the system had performed and wanting a critique. That level of concern, both for the customer satisfaction and the continued refinement of his system, says a lot about *Comtek System's* and Jim Miller.

Steve, WA4CTA

Steve:

Thanks for the very interesting letter. The ability to use the array effectively on both the CW and SSB parts of 80 meters is a very important point. This has always been the Achilles Heel of the yagi based rotatable arrays. When you factor in the cost of the rotor, control cable and tower with an 80 meter yagi you find that you are paying about $1,000 per db. of gain over the *Comtek* vertical array. Your scores in the CW and SSB tests are pretty dramatic testimony to the *Comtek* systems performance. The SSB results are of particular note in that conditions that weekend were marginal at best. I hope you can work your last two 80 meter zones this winter.

Lance:

My wife is a statistical consultant and is looking at the Boulder "A" Index numbers from the December *Low Band Monitor*. I will let you know if any interesting insights come out of her analysis. One day that stands out for me this year is November 11. While working with I0GPY on 3.794 mz. I was working Europeans that needed Iowa on 75 meters. By the time the session ended, I had worked 19 European stations. The past three weeks have put more 75 meter DX contacts in my log than ever before. However, I would like to bring up a rather controversial topic - the ARRL SSB Sweepstakes. During this contest there were quite a number of U.S. contest stations operating in the 75 meter DX window. At first, a number of us responded to the CQ's with requests to move out of the window, or offered to work the station somewhere else. The majority of the stations apologized or otherwise quickly moved out of the window, but a few hard-core contesters refused to move. K1AR grudgingly moved after a long argument with several of us, saying that CW was made for DXing. Late in the contest, K0OD, who was helping me clear the DX window commented that we should start announcing who these stations are that were operating in the window on our packet cluster. I started doing this as, "3.794 mz K1AR Contesting in DX Window", and found that this method was accepted by the sysop and all of the locals on the cluster. I even got some supportive comments from the 8th call area. K8CC wouldn't respond to verbal requests by several DXers to move out of the window, but he did after being noted on packet. The only negative comment was received from a 9 land operator who said, "How can you work DX on 75 meters when the "A" Index is 25!" Two hours later I worked YU7OF on 3.799 mz. with a 59 plus 5 db. signal report - which is an unusually good report for me. K1AR's excuse was, "If I leave, someone else will move into the window five minutes later". I guess I will get off my soapbox now, but you would think some of the more experienced operators would stay out of the 75 meter DX window.

Clay, WA0GFS

Clay:

Your letter brings up some very provocative points. First, I will visit N.O.A.A. in Boulder, Colorado again and attempt to acquire the 1994 Boulder "A" Index numbers immediately after years end. Second, you will find that playing your Iowa card will continue to help your effectiveness on 75 and 160 meters. It should be noted that the trend today on 80 meters regarding the building of a DXCC total is skewed more towards SSB than CW. There is definitely more exotic DX on CW, but without question there are more DXCC countries available on a daily basis on SSB. I optimized my 80 CW Delta loop's (90' apex) this summer, at the expense of the 75 meter Delta loop's (70' apex) performance. Today I am not so sure I made the right decision. To be perfectly honest, as a Sweepstakes competitor; if I was operating competitively in the ARRL SSB Sweepstakes, I too would choose the 75 meter DX window to operate. The abuse dished out by a 75 meter DXer is a lot milder than the thrashing you get from the "Nebraska Chicken Pluckers" Net or the "Mississippi Catfish Gutters" Net up the band. My long-term approach for correcting this problem is for the ARRL or Cowan Publishing to develop a logging/rig control software that would simply "lock out" contacts made outside of the frequency range recommended by the Sweepstakes or DX contest organizers. From a software standpoint this is almost trivial and would work on most of the newer transceivers. My short term approach to people like K1AR is to go to the garage and tinker with one of my cars while Sweepstakes is on. You should always have a method of mentally escaping from situations like this - it's like discovering 10 miles down the road - that your Wendy's drive through burger has mayonnaise instead of ketchup - you really can't win - you simply move on. When K1AR receives his 1994 Sweepstakes plaque, all will be forgotten and believe me he and other Sweepstakes enthusiasts will be back in the DX window again in 1995. Maybe a WA0GFS 3.795 mz. "single frequency" Sweepstakes effort should be planned for 1995? Seriously, K0OD's and your self policing approach that puts DX window intruders on the DX Packet Cluster™ screen is quite clever. These different operating agendas are a real challenge to the low band DXer. At least the 75 meter DX segment has a band plan. There is no official band plan on 160 meters. We get SSB chit-chat every morning on 1.823 mz. which is prime CW DX territory. Our European subscribers say that the bands are even worse on their continent. As I am writing this letter, ON4UN is calling CQ on 160 meters in the ARRL 160 Contest and not one but two stateside stations are calling CQ right on top of him. Some things never change...

Lance:

I read the article by K9FD on receiving loops with much interest. I have been using a small loop for low band DXing and appreciate someone else verifying what I have also experienced over a long period of time. Regarding pre-amps for loop antennas, the new Ameco PT-3 is excellent. It has a modification that allows you to listen and then switches over to the transmit antenna when it's time for the Alpha. This modification kit adds another relay and coax input to the preamp when you are in close proximity to the transmit antenna. Using a small loop and the preamp and my large (roof perimeter) loop with no preamp for comparison, I have better receiving performance about 40 percent of the time with the small loop combination. However, when I put my large loop through my tuner, it runs circles around the small loop and preamp. Unfortunately, the tuner makes the loop resonant and it re-radiates RF like crazy at my QTH. I developed some serious RFI problems with my next door neighbor and had to revert to the small loop. I still believe that the roof perimeter loop would be the better of the two suburban loop approaches, if the RFI problem could be solved. When I win the lottery or get my two kids through college, I plan to move into the country and start using Beverages.

Mike, AB0X

Mike:

It would be interesting for you to try the K9FD Loop using the large center conductor (the secret) 75 ohm hardline Merv alludes to, instead of the RG-59 you now use on your small loop. I am also going to try one of K9FD's loops with some RG-17 coax that has a real macho center conductor. Perhaps you could use a relay to detune your large loop on transmit, but this is not trivial when the resonant loop is in such close proximity to the receive antenna. Most college graduates in the U.S. are finally leaving home at age 30. We will look for you to be living in the country by 2015. In the "hot" Denver economy the Petroleum Engineers wait tables at Denny's, the Mechanical Engineers run cash registers at Target and the Electrical Engineers work at Radio Shack. The Psychology and Sociology majors work at Wal-Mart and K-Mart. These and other college educations are no longer viable methods for obtaining entry into the American Dream. Save your tuition money and buy your kids a Subway or Mail Boxes Etc. franchise now, while they still have lots of energy. Today the traditional four year college degree still has utility for the idle rich, "born on third base" type individual, but in the 1990's the best place to put your hard earned tuition money is into your own family business. Use the learning institutions for tax deductible seminars when you need them.

Lance:

This morning I was working VK4EMM on 40 meter CW and he told me that he was using the antenna featured in the *Low Band Monitor*, Volume 2 Number 7. I have not heard of your publication and would like to receive a sample before I subscribe. Enclosed you will find $3.00 for a sample.

Harry, VE7AIJ

Harry:

Thank you for the sample request from Canada. We have very few subscribers from your country and have always been intrigued about the propagation (or lack of) you experience The extra copies of the issue you describe went very quickly. I still have back issues from nine other months that will give you a general idea about the newsletter concept. We started in April 1993. The format is twelve pages, monthly distribution, low band DX spots, readers forum, propagation, antennas, awards program and equipment reviews related to low band operation. When my blood sugar runs low I also tend to babble about the demise of the middle class in the U.S.

Lance:

While working on the Toroid Investigation feature for Beverage Antennas in the *Low Band Monitor* I found that I had a particular Beverage that did not work as well as my other Beverage antennas. By chance, I simply removed about 50' of wire from the end, re-attached the terminating resistor and the performance improved dramatically. Tell your readers that before they give up on a Beverage, try lengthening or shortening the Beverage wire by a nominal length and re-evaluate the receiving performance.

Charlie, KY0A

Charlie:

This is an interesting observation. I have had a couple of other readers comment independently about "magic lengths" for a Beverage antenna that tend to work better than other lengths. What is curious about this is that some of the most effective lengths are substantially shorter than what the low band enthusiast could be using - the shorter length is selected simply because it seems to work better. Perhaps you don't need 80 acres to do a Beverage system "right" maybe a mere 40 acres will do?

Lance:

Enclosed is my log for 100 DXCC countries on 80 meters this season. I got off to a slow start on the third of October and had to take down my vertical due to a typhoon coming through our area.

My 80 meter vertical is made from a carbon fiber fishing rod that weighs less than a pound. This pole is about 30 feet long and is mounted at the top of my 56 foot tower. I tape aluminum wire to the rod to serve as the radiator. This rod is very durable and bends in the wind just like you were reeling in a Marlin. I only have two radials and I often use the radials as an inverted V for local use. I have a couple of inductors at the base that permit the use of the vertical on both the 75 and 80 meter bands. To date I have worked 180 countries with this antenna and have been very satisfied with it's performance. I have become a fishing rod freak and all of my antennas are made from fishing rods. I have also tried 2 Element 75 meter beams, a 4 element 40 meter beam and other low band antennas at the QTH of JH0ZHQ. The rig here is a Kenwood TS-950 and a single 3-500Z tube SB-1000. Conditions in the ARRL 160 CW were terrible. My friends and I operated from JH0ZHQ. The poor weather really hurt us here as a balloon 160 meter vertical was our big weapon. We launched the balloon in high winds and managed only 15 DX contacts. Our station has won in the multi-op category for four consecutive years, but this time the stations in Southern Japan fared better.

I enjoy the *Low Band Monitor* and hope to work many of your subscribers on the low bands this season.

Shigeru, JH1GNU/WG6B

Shigeru:

Very impressive 80 meter 100 Country submission. Our readers will be impressed that the second country you worked this season on 80 meters was XU7VK. That is what I call getting off to a fine start! We will use your log and three other U.S. logs from various parts of the country to show what is really being worked. Your log is quite interesting as you confirm for us that there isn't much activity from Oceania and that the continent of Europe is critical for building a country total from Japan. Your log also shows us how difficult it is to work North American DX stations on 80 meters from Japan. The fishing poles look very interesting and would obviously be a good choice for any DXer that needs flexibility in his operation. I also have a Helium tank and have launched a 160 meter baloon vertical a few times. Even if conditions are bad, I always have a lot of fun when using them, even when the wind knocks them to the ground. Conditions in the CQ 160 Contest were just fair in the Midwest. We heard about ten JA stations and five Europeans. We will wait till next year.

Lance:

The first night of the CQWWDX CW Contest was great from Michigan on 160 meters, but poor on the second night. Finished up with 17 Zones and 49 countries. December 10 was exceptional with 15 EU and African being worked including ZA1J. Year to date, I have worked 72 countries on 160 meters with 15-20 more heard.

George, W8UVZ

George:

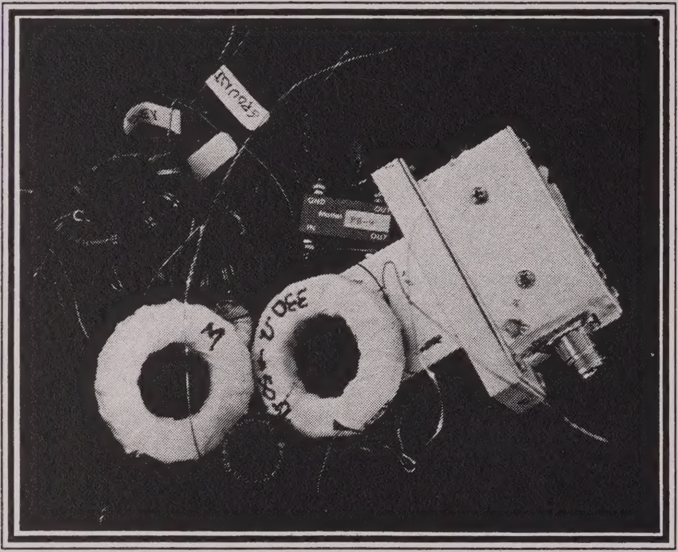
I missed the European sunrise the first night. KV0Q tells me that Europe was also good in Colorado on the first night. Congrats on ZA!

Toroid Transformer Investigation

What Is the Hot Trick Set-Up? - by KY0A

Editor's note: Have you ever tried to improve your Beverage antenna's receive capability? A good place to start is at the matching (typically 9:1) transformer. In this article KY0A explores a number of different toroidal transformer configurations for use with Beverage antennas in an attempt to discover the "hot trick set up".

Background - Beverage antenna performance can be greatly affected by the system's matching transformer and terminating resistor combination. I have always been curious to see if the type of toroid used in the system could perhaps improve overall receiving performance.



Here's the group of toroid matching devices evaluated by KY0A in his search for Beverage antenna optimization.

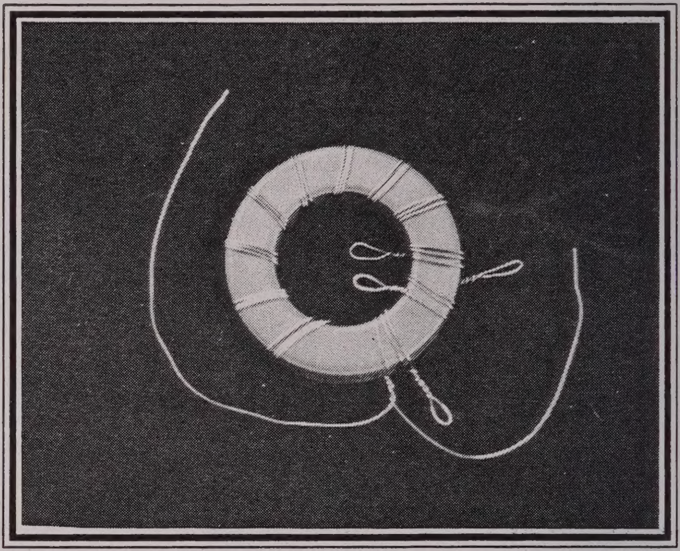
To explore the possibilities, I obtained a number or cores that would be suitable for use with a Beverage antenna. These cores were all wound to obtain an appropriate match to a Beverage antenna. Since a terminated Beverage has a characteristic impedance of 450 ohms and you are typically attempting to match the 50 ohm input to your receiver, a 9:1 matching scheme is used.

Initial Test Set Up - The cores were first wound using tri-filar and quadra-filar windings. It was then decided to stay with the tri-filar windings as it took less time to make a transformer and less wire is used. However, I will state here, that when comparing the performance of tri-filar vs. quadra-filar winding methods on these transformers, no performance difference was noted.

After winding the cores a 10 watt no-inductive 480 ohm resistor was connected from the Beverage lead to the ground lead. Output from my Icom 781 was set at 10 watts and was connected to the coax (loop) lead and to ground. A Bird watt meter with a 50 watt slug was initially used to obtain the various SWR readings.

These initial readings were compared with the readings recorded with the MFJ-259 RF Resistance Meter. The readings with the two test configurations were the same, so the MFJ-259 was used for all of the SWR readings. The impedance portion of the MFJ-259 also allowed me to set the toroid coil taps more accurately.

Transformer SWR Data - The broad SWR characteristics of each transformer are of interest because they tell the low band DXer over what frequency range this matching device will function most effectively and these readings also give us a "warm feeling" with respect to being properly matched on our favorite low frequency band.



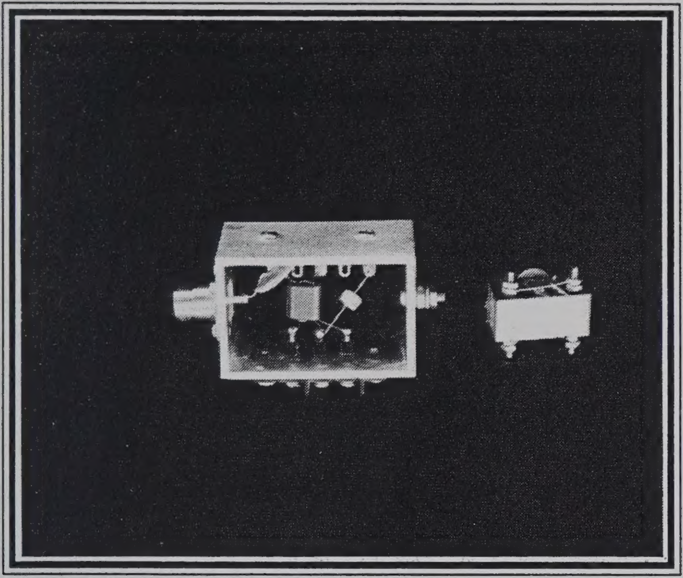
The long lead goes to the Beverage, the short lead to ground and the loops are the appropriate taps.

The term "warm feeling" is used because it is doubtful that a 1.2 : 1 SWR would yield better Beverage receiving system performance at 1.827 mz. than say a 1.4 : 1 SWR. But do we want to take a chance?

Glass Cloth Electrical Tape used to secure the windings to the toroid core.

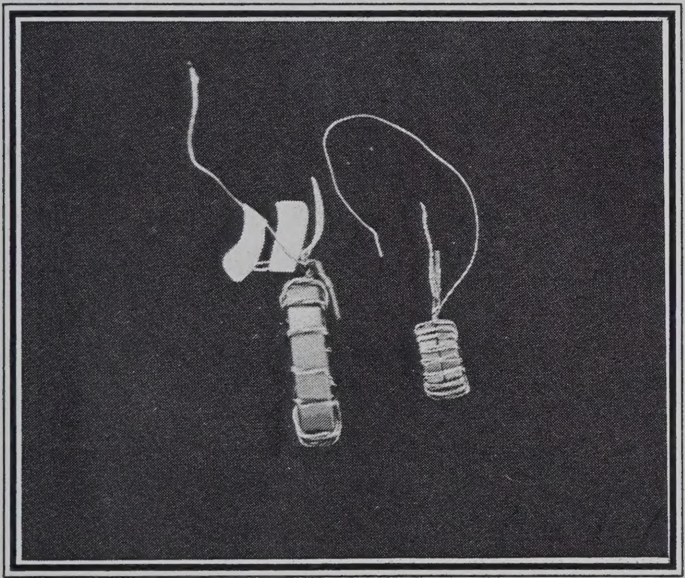
After testing the assortment of transformers, I then selected the three perceived best transformers for actual testing and comparison in the field: The stacked FT-114's, the stacked FT-240's and the mystery core.

A relay box was configured that allowed me to switch any of the three transformers into the Beverage to see if there was an actual performance increase. After the first group was tested the rest of the transformers were also evaluated.



The ICE 180 type Beverage transformer and the Palomar 9:1 matching Balun. Notice the small size toroids used in each of these commercial units.

Field Test Results - The results were surprising. There was no ear discernable difference between any of the cores that were tested. If there was a winner it would be the mystery core that I had in my junkbox. Even the stacked cores showed no noticable performance increase when being evaluated by ear.



The tri-filar winding at left was twisted prior to winding on the core - not efficient as wire is not close to core.. The stacked pair on the right showed no gain over a single core.

Why would this be? I think the fact that there are two losses in each toroid, wire losses and core losses, that there is a performance trade off when considering actual core size.

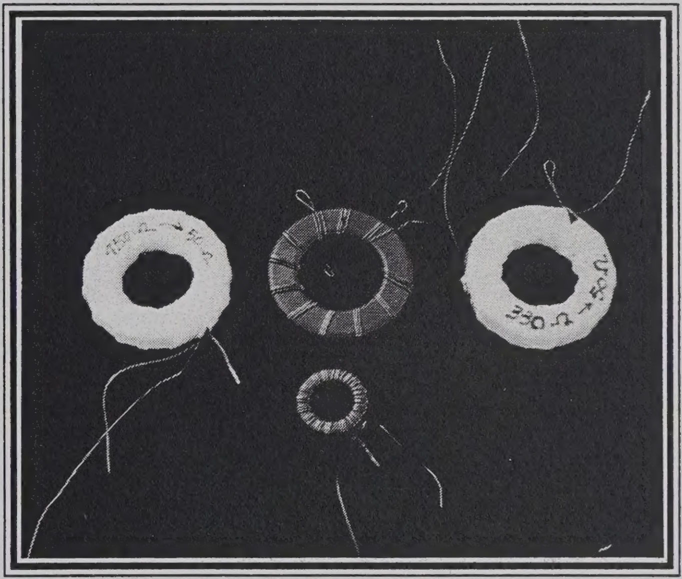
The larger the core, the more loss in the wire and in the core, but the larger cores offer better survivability with respect to lightning and RF energy. They are also easier to wind.

The commercial ICE and Palomar transformers were also tested. The ICE unit is extremely well made and features multiple taps for 300, 450, and 600 ohms, that is a very good idea. The Palomar device was a general purpose balun type transformer.

However, in my receiving comparison with the various home made Amidon devices, I could not get equivalent receiving performance with the commercial units. They work, but to my ear, they did not work as well as the as the units that used the larger toroids. I can only speculate on why this situation was observed.

General Observations - Wire selection is critical when winding these transformers. The turns need to lie right on the surface of the core and be spaced close together, covering about 80 percent of the core. A wire size that is too large will leave you with air gaps around the core and hurt efficiency. Glass Cloth Electrical tape is available from 3M. This tape can be used to keep the windings solidly locked on the core, after the correct ratio has been achieved. When counting the wire turns count the turns on the inside of the core and not the outside.

Twisted wires seem to broad band the core. When using this method you must lay independent wires on the core instead of winding with one continuous wire and then solder the top of one coil to the bottom of the next that is not as sanitary. In practice I found that it tends to be easier (and neater) winding the cores with one continuous wire.



Lay your wire turns right next to each other. The Glass Cloth Tape is used to keep the turns from separating.

In an ideal situation you would start with a 9:1 transformer and then vary the terminating resistance for best front-to-back performance. Then re-tap the transformer to match the value of the new optimized termination resistance.

In the real world, get the best 9:1 transformer you can muster, hook up your Beverage and don't worry about it!

Conclusion - For the average Beverage system there is little difference between any of the matching transformer devices reviewed here. Low band enthusiasts should be able to construct low cost transformers for their Beverage system that work at least as well as commercially available units.

If good construction techniques are used any of the devices discussed here should provide the builder with good low band receiving performance.

BEVERAGE TOROID TRANSFORMER HARD (SWR) DATA - by KY0A

CORE	CONFIGURATION	WIRE	TURNS	FREQ	SWR
FT-114	SINGLE CORE	#26	16	1.8	1.20 - 1
				3.5	1.10 - 1
				7.0	3.00 - 1
				10.1	3.75 - 1
				14.0	8.00 - 1
FT-114	STACKED PAIR	#24	16	1.8	1.10 - 1
				3.5	1.50 - 1
				7.0	2.50 - 1
				10.1	3.50 - 1
				14.0	7.50 - 1
FT-140	SINGLE CORE	#24	11	1.8	1.50 - 1
				3.5	1.50 - 1
				7.0	2.40 - 1
				10.1	4.20 - 1
FT-240	SINGLE CORE	#22	11	1.8	1.20 - 1
				2.0	1.10 - 1
				3.5	1.20 - 1
				4.0	1.40 - 1
				7.0	2.25 - 1
				10.1	3.00 - 1
FT-240	SINGLE WIRES (TWISTED)	#20	11	1.8	1.25 - 1
				2.0	1.25 - 1
				3.5	1.25 - 1
				4.0	1.25 - 1
				7.0	2.00 - 1
				7.3	2.10 - 1
				10.1	4.00 - 1
FT-240	STACKED PAIR	#22	11	1.8	1.20 - 1
				2.0	1.10 - 1
				3.5	1.20 - 1
				4.0	1.20 - 1
				7.0	1.70 - 1
				10.1	1.90 - 1
ICE	SINGLE CORE	N/A	N/A	1.8	1.10 - 1
				2.0	1.10 - 1
				3.5	1.30 - 1
				4.0	1.50 - 1
				7.0	2.30 - 1
				7.3	2.40 - 1
				10.1	4.00 - 1
2" ??	SINGLE CORE	#22	11	1.8	1.20 - 1
				2.0	1.10 - 1
				3.5	1.20 - 1
				4.0	1.25 - 1
				7.0	2.40 - 1
				10.1	4.00 - 1

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80 METERS

3509.0	EW4CW	14-Dec-1994	2353Z
3507.8	EU7SA	14-Dec-1994	2210Z
3514.5	UT7LM	14-Dec-1994	2207Z
3511.0	US0SU	14-Dec-1994	2206Z
3519.5	RV3DEX	14-Dec-1994	0237Z
3797.0	VE2PR	14-Dec-1994	0221Z
3790.0	TA2DS	14-Dec-1994	0103Z
3795.7	ZB2FK	14-Dec-1994	0009Z
3503.0	ES6DO	13-Dec-1994	1442Z
3796.0	V63AO	13-Dec-1994	1243Z
3509.5	ZL7AMO	13-Dec-1994	1242Z
3793.5	SV8JE	13-Dec-1994	0520Z
3787.0	C31UA	13-Dec-1994	0507Z
3783.0	9M8DB	12-Dec-1994	1448Z
3516.0	TR8XX	12-Dec-1994	0558Z
3511.0	7P8SR	11-Dec-1994	0345Z
3511.5	5B4OG	11-Dec-1994	0215Z
3792.0	A61AN	11-Dec-1994	0031Z
3792.0	9K2MU	11-Dec-1994	0018Z
3510.5	BY1QH	10-Dec-1994	1540Z
3505.5	RX9FM	10-Dec-1994	1203Z
3503.0	UA9MA	10-Dec-1994	1157Z
3505.0	TF3DX	10-Dec-1994	1033Z
3789.0	SV5TS	10-Dec-1994	0621Z
3511.9	ZA1AJ	10-Dec-1994	0414Z
3510.9	YO4HW	10-Dec-1994	0325Z
3514.7	UR7VA	10-Dec-1994	0312Z
3792.0	9K2MU	10-Dec-1994	0103Z
3794.0	JT1BR	9-Dec-1994	1537Z
3508.2	RX9FM	9-Dec-1994	1205Z
3506.0	JW0I	9-Dec-1994	1152Z
3797.3	UN7VV	9-Dec-1994	1144Z
3795.0	SU2MT	9-Dec-1994	0559Z
3798.0	CE8EIO	9-Dec-1994	0425Z
3799.0	YO5ODE	9-Dec-1994	0413Z
3505.0	7Q7LA	9-Dec-1994	0306Z
3795.0	A61AN	9-Dec-1994	0035Z
3795.0	9G1MR	9-Dec-1994	0026Z
3799.4	7X2LS	8-Dec-1994	2216Z
3518.7	LY2WW	8-Dec-1994	0641Z
3791.0	SV1AOZ	8-Dec-1994	0502Z
3794.0	SV1EX	8-Dec-1994	0320Z
3515.0	9K2MU	8-Dec-1994	0102Z
3504.2	UN7TX	7-Dec-1994	0205Z
3798.0	LX9UN	6-Dec-1994	2215Z
3502.5	TF3DX	6-Dec-1994	1108Z
3799.2	SV3AQR	6-Dec-1994	0301Z
3506.0	TU4SR	6-Dec-1994	0113Z
3513.0	VQ9QM	4-Dec-1994	2322Z
3513.3	VQ9QM	4-Dec-1994	1740Z
3509.5	BV2TA	4-Dec-1994	1304Z
3796.0	Z31PK	4-Dec-1994	0533Z
3500.5	T91EVC	4-Dec-1994	0507Z
3506.9	T5AR	4-Dec-1994	0234Z
3509.2	5R8DG	4-Dec-1994	0141Z
3790.0	C31OF	4-Dec-1994	0125Z
3505.5	3DA0BK	3-Dec-1994	2344Z
3793.0	SV5TS	3-Dec-1994	2243Z
3506.2	XU7VK	3-Dec-1994	1506Z
3791.0	SV1AOZ	3-Dec-1994	0602Z
3785.2	8R1AK	3-Dec-1994	0534Z
1837.0	5T5JC	2-Dec-1994	2337Z
3515.5	A22MN	2-Dec-1994	0354Z
3506.9	3DA0BK	2-Dec-1994	0157Z
3501.6	T5AR	2-Dec-1994	0001Z
3511.6	A22MN	1-Dec-1994	0411Z
3513.9	9A2AJ	1-Dec-1994	0150Z
3501.9	Z32JA	1-Dec-1994	0139Z
3786.1	9J2GA	29-Nov-1994	0329Z
3506.0	3DA0BK	29-Nov-1994	0255Z
3509.9	9G5MF	29-Nov-1994	0146Z
3521.9	KH0AM	27-Nov-1994	1051Z
3514.8	ZB2X	27-Nov-1994	0153Z
3545.0	TU2MA	27-Nov-1994	0131Z
3519.7	4U1VIC	27-Nov-1994	0128Z
3505.0	UN7TX	27-Nov-1994	0120Z
3538.0	9G5AA	27-Nov-1994	0102Z
3544.2	YK0A	26-Nov-1994	2341Z

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7004.0	TU4SR	24-Dec-1994	2309Z
7003.1	FR5HG	24-Dec-1994	2131Z
7004.3	ZS6QU	24-Dec-1994	2125Z
7003.6	UA6LTI	24-Dec-1994	1451Z
7011.0	UR7VA	24-Dec-1994	1449Z
7006.5	S53A	24-Dec-1994	1449Z
7005.6	EW6WJ	24-Dec-1994	1439Z
7012.8	VU2XTO	24-Dec-1994	1421Z
7005.0	VU2RX	24-Dec-1994	1432Z
7019.0	ES1WN	24-Dec-1994	0743Z
7006.0	UY2VM	24-Dec-1994	1421Z
7004.5	JW0H	23-Dec-1994	1438Z
7009.1	BV7FF	23-Dec-1994	1358Z
7004.3	TU4SR	22-Dec-1994	2339Z
7004.8	ZB2FK	22-Dec-1994	0040Z
7004.9	ZP6CW	21-Dec-1994	0743Z
7004.9	V51BI	20-Dec-1994	2247Z
7003.0	TA3D	20-Dec-1994	2246Z
7008.0	VU2MTT	20-Dec-1994	1229Z
7015.0	HC5AI	20-Dec-1994	1219Z
7011.5	VU2XTO	20-Dec-1994	1215Z
7005.0	VP8CQS	20-Dec-1994	0255Z
7003.2	ZD8KJ	20-Dec-1994	0256Z
7003.0	VP8CQS	19-Dec-1994	0040Z
7008.0	JT1BH	18-Dec-1994	2335Z
7007.0	HS7ECI	18-Dec-1994	1644Z
7007.0	9M8FC	18-Dec-1994	1612Z
7003.4	ON4UN	18-Dec-1994	1450Z
7011.5	VQ9SS	18-Dec-1994	1442Z
7008.0	YK1AO	18-Dec-1994	1429Z
7010.1	SV1BOH	18-Dec-1994	0057Z
7002.0	VP8CQS	18-Dec-1994	0043Z
7009.3	3V8BB	17-Dec-1994	2327Z
7008.5	3DA0CA	17-Dec-1994	2300Z
7007.0	RW0LL	17-Dec-1994	2238Z
7005.6	JW5NM	17-Dec-1994	1227Z
7050.0	ZD7WRG	17-Dec-1994	0325Z
7004.0	9M2FK	16-Dec-1994	2257Z
7012.0	ET3BN	16-Dec-1994	2233Z
7059.0	OD5RZ	16-Dec-1994	2217Z
7011.0	ZL7AMO	16-Dec-1994	1229Z
7004.2	ZB2EO	16-Dec-1994	0748Z
7004.5	VU3VOA	16-Dec-1994	0141Z
7007.2	TA2FE	16-Dec-1994	0025Z
7004.4	C31LL	15-Dec-1994	2330Z
7009.5	9Q5BB	15-Dec-1994	2308Z
7055.0	OD5NJ	15-Dec-1994	2053Z
7014.3	9M8FC	15-Dec-1994	1505Z
7005.7	YK1AO	15-Dec-1994	1447Z
7007.9	VQ9SS	15-Dec-1994	1433Z
7006.4	3B8FG	15-Dec-1994	1411Z
7007.3	SM0CNS/DU7	15-Dec-1994	1351Z
7003.3	HZ1AB	15-Dec-1994	1345Z
7004.0	FY5YE	15-Dec-1994	0303Z
7006.0	TU4SR	15-Dec-1994	0037Z
7006.0	C31LFT	14-Dec-1994	1001Z
7001.6	9X5EE	13-Dec-1994	2220Z
7004.5	3B8FG	13-Dec-1994	1353Z
7005.0	4K500C	13-Dec-1994	1315Z
7075.0	ZL7AMO	13-Dec-1994	1218Z
7006.5	3B8CF	13-Dec-1994	0243Z
7008.0	VU2XTO	13-Dec-1994	0120Z
7006.0	TU4SR	12-Dec-1994	2212Z
7010.0	ZL7AMO	12-Dec-1994	1245Z
7002.4	VS6WO	11-Dec-1994	1559Z
7010.0	FR5DN	11-Dec-1994	1512Z
7010.0	BZ1QL	11-Dec-1994	1504Z
7010.0	VQ9SS	11-Dec-1994	1450Z
7007.0	FR5DN	11-Dec-1994	1431Z
7006.0	HL9DC	11-Dec-1994	1414Z
7005.0	JW5NM	11-Dec-1994	1200Z
7000.9	A35RK	11-Dec-1994	0626Z
7001.0	ER1LW	10-Dec-1994	2313Z
7003.2	HL1KSE	10-Dec-1994	1426Z
7006.0	ZL7AMO	10-Dec-1994	1340Z
7007.0	VU2MAT	10-Dec-1994	1308Z
7010.7	UK7R	10-Dec-1994	1229Z
7001.0	OM7DX	10-Dec-1994	1210Z

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7013.4	6W6JX	10-Dec-1994	0436Z
7004.3	7P8SR	10-Dec-1994	0419Z
7009.0	A71CW	9-Dec-1994	2310Z
7004.4	JW0I	9-Dec-1994	1230Z
7006.0	9K2MU	9-Dec-1994	1343Z
7006.0	ZA1J	9-Dec-1994	0221Z
7001.1	V51BI	8-Dec-1994	2213Z
7009.8	HL2DNK	8-Dec-1994	1621Z
7003.7	9M8FC	8-Dec-1994	1602Z
7003.6	BV2RF	8-Dec-1994	1555Z
7005.7	BY6RC	8-Dec-1994	1457Z
7007.0	A71CW	8-Dec-1994	1311Z
7004.0	UN7TX	8-Dec-1994	1202Z
7001.2	8R1J	7-Dec-1994	2107Z
7015.0	VU7FWW	7-Dec-1994	1402Z
7005.0	Z32XA	7-Dec-1994	0128Z
7000.5	9X5EE	7-Dec-1994	0030Z
7009.5	V73C	6-Dec-1994	1056Z
7021.8	BV7EJ	5-Dec-1994	1213Z
7006.0	3V8BB	4-Dec-1994	2319Z
7006.1	J28BD	4-Dec-1994	2321Z
7010.5	9H1AL	4-Dec-1994	2315Z
7001.2	UN9LX	4-Dec-1994	1250Z
7004.8	6W1AE	4-Dec-1994	0459Z
7006.2	9J2BO	4-Dec-1994	0437Z
7006.0	3V8BB	4-Dec-1994	0238Z
7012.1	ZD8KJ	3-Dec-1994	2201Z
7002.6	BV/K1RX	3-Dec-1994	2144Z
7005.7	XX9X	3-Dec-1994	2135Z
7008.5	FK8GJ	4-Dec-1994	1304Z
7022.0	FO0TSU	4-Dec-1994	0057Z
7013.0	JI7BCD/JD1	3-Dec-1994	2355Z
7209.1	V63JC	2-Dec-1994	1146Z
7001.7	PY0FF	2-Dec-1994	0845Z
7005.0	TU5EV	2-Dec-1994	0513Z
7049.0	CT1DIZ	2-Dec-1994	0320Z
7049.0	FR5DX	2-Dec-1994	0317Z
7050.0	FR5ZU/G	2-Dec-1994	0306Z
7004.5	FO0TJ	30-Nov-1994	1333Z
7002.8	BV4JB	30-Nov-1994	1243Z
7069.2	FR5ZU	30-Nov-1994	0245Z
7002.3	T32BE	29-Nov-1994	0646Z
7005.0	TU2XZ	28-Nov-1994	0032Z
7031.0	EM0F	27-Nov-1994	2356Z
7050.1	A71CW	27-Nov-1994	2151Z
7043.7	RW2F	27-Nov-1994	2150Z
7027.0	VQ9KC	27-Nov-1994	2038Z
7041.5	ER0AM	27-Nov-1994	2013Z
7024.4	9M8X	27-Nov-1994	1332Z
7017.0	T32BE	27-Nov-1994	1006Z
7029.9	OY1CT	27-Nov-1994	0112Z
7000.1	TF3CW	27-Nov-1994	0015Z
7005.7	TA2E	26-Nov-1994	2330Z
7026.3	J28EN	26-Nov-1994	2240Z
7036.1	H20A	26-Nov-1994	2235Z
7030.5	5T5JC	26-Nov-1994	2221Z
7007.2	YK0A	26-Nov-1994	2210Z
7011.2	JW0I	26-Nov-1994	2150Z
7041.1	UR7GW	26-Nov-1994	2138Z
7005.1	VS6WO	26-Nov-1994	2103Z
7027.9	A22MN	26-Nov-1994	2042Z
7015.3	TU5EV	26-Nov-1994	2039Z
7038.3	9G5AA	26-Nov-1994	2024Z
7021.6	4U1VIC	26-Nov-1994	2018Z
7028.7	YK0A	26-Nov-1994	2015Z
7026.3	J28EN	26-Nov-1994	1930Z
7007.3	9H1EL	26-Nov-1994	1828Z
7037.8	FK8FU	26-Nov-1994	1357Z
7003.8	9K2ZZ	26-Nov-1994	1304Z
7034.0	VQ9QM	26-Nov-1994	1235Z
7022.2	KH0AM	26-Nov-1994	1301Z
7016.2	XX9X	26-Nov-1994	1221Z
7006.9	VU2VOA	26-Nov-1994	1216Z
7011.1	VU2XTO	26-Nov-1994	1213Z
7014.9	JW0I	26-Nov-1994	1213Z
7009.3	VR2GO	26-Nov-1994	1154Z
7015.6	UN8LW	26-Nov-1994	1154Z
7005.0	YK0A	22-Nov-1994	2306Z

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TNX: W8TN - WA0GFS - WA4CTA - AA6TT - K0HA - WA7KFV - K1ZM - AB6ZV - KV0Q - K9FD - KG7IZ - N7MC - W0RI - KC7V - K6SSS - N4KG KY0A - VE7SZ - W8AH - W1WAI - K0IJL - AJ6T - K6RK - W8UVZ - K4SXT - WB9GYU - AB0X - NX0I - WB9Z - SV1AOZ - WB9GYU - SM4CAN

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1824.0	7P8CW	24-Dec-1994	0315Z
1829.0	9A2TW	23-Dec-1994	0530Z
1823.0	UA0FDX	22-Dec-1994	1408Z
1831.0	SP5GRM	22-Dec-1994	0650Z
1824.2	RA0FU	20-Dec-1994	1332Z
1832.5	5W1MM	20-Dec-1994	0536Z
1835.7	UX0ZZ	19-Dec-1994	0410Z
1835.4	UR0MC	19-Dec-1994	0331Z
1836.5	I2YSB	19-Dec-1994	0304Z
1827.0	UA0FDX	19-Dec-1994	1507Z
1827.0	A35RK	18-Dec-1994	1226Z
1824.0	OZ1BT	18-Dec-1994	0741Z
1826.0	ON4ACG	18-Dec-1994	0723Z
1830.0	OS8RD	18-Dec-1994	0716Z
1826.3	DF3OL	18-Dec-1994	0707Z
1824.5	DL1RWN	18-Dec-1994	0704Z
1822.4	ON7PQ	18-Dec-1994	0656Z
1812.8	LA5SAA	18-Dec-1994	0648Z
1836.1	PA0CLN	18-Dec-1994	0639Z
1812.7	LA5SAA	18-Dec-1994	0651Z
1831.6	ON4UN	18-Dec-1994	0649Z
1833.1	OM2XW	18-Dec-1994	0626Z
1823.3	SP4EEZ	18-Dec-1994	0621Z
1828.9	OH6KD	18-Dec-1994	0617Z
1833.9	SM4SCM	18-Dec-1994	0612Z
1838.3	UY5BA	18-Dec-1994	0607Z
1834.3	OH8RD	18-Dec-1994	0557Z
1830.6	ON4ACG	18-Dec-1994	0557Z
1825.6	OM5ZM	18-Dec-1994	0554Z
1823.3	YO3APJ	18-Dec-1994	0547Z
1824.6	9A2TW	18-Dec-1994	0545Z
1820.9	LA5SAA	18-Dec-1994	0532Z
1823.3	UY5BA	18-Dec-1994	0530Z
1836.4	OK1AUN	18-Dec-1994	0529Z
1845.0	UA2FF	18-Dec-1994	0517Z
1838.0	EU6AF	18-Dec-1994	0514Z
1828.5	SM5EDX	18-Dec-1994	0450Z
1835.1	UR0MC	18-Dec-1994	0423Z
1829.5	OM8AU	18-Dec-1994	0439Z
1831.7	UR5FA	18-Dec-1994	0430Z
1830.8	EA6AB	18-Dec-1994	0209Z
1837.1	LY2BS	18-Dec-1994	0107Z
1826.8	LA5SAA	18-Dec-1994	0046Z
1835.5	EI5BW	17-Dec-1994	2357Z
1827.6	GI3OQR	17-Dec-1994	2350Z
1828.1	SV8ZS	17-Dec-1994	2210Z
1826.0	5W1MM	17-Dec-1994	1324Z
1831.0	FK/JP1IHT	17-Dec-1994	1149Z
1834.3	PA0CLN	17-Dec-1994	0725Z
1821.5	OH1MA	17-Dec-1994	0703Z
1831.8	OZ7YY	17-Dec-1994	0702Z
1838.0	GJ3YHU	17-Dec-1994	0646Z
1827.4	SP5GRM	17-Dec-1994	0637Z
1825.3	OH1XX	17-Dec-1994	0635Z
1836.6	ON5NT	17-Dec-1994	0631Z
1831.4	OH1MA	17-Dec-1994	0613Z
1818.5	9A2TW	17-Dec-1994	0610Z
1817.2	OZ1LO	17-Dec-1994	0612Z
1836.7	OZ8ABE	17-Dec-1994	0534Z
1838.6	OH4YR	17-Dec-1994	0531Z
1811.0	LA5SAA	17-Dec-1994	0525Z
1837.5	EA6NB	17-Dec-1994	0524Z
1835.5	OZ1ING	17-Dec-1994	0520Z
1821.0	OE5KE	17-Dec-1994	0520Z
1822.6	OH6WZ	17-Dec-1994	0517Z
1833.0	IV3PRK	17-Dec-1994	0511Z
1834.0	EW3LB	17-Dec-1994	0506Z
1833.6	OK1DOT	17-Dec-1994	0501Z
1839.9	UA3DRV	17-Dec-1994	0459Z
1833.5	OK1DX	17-Dec-1994	0450Z
1840.0	4L4KK	17-Dec-1994	0439Z
1831.0	GM3ITN	17-Dec-1994	0436Z
1837.0	HA7PF	17-Dec-1994	0435Z
1821.9	OH4YR	17-Dec-1994	0433Z
1820.7	OK1AUN	17-Dec-1994	0424Z
1829.9	OM2XW	17-Dec-1994	0406Z
1825.8	OM8AU	17-Dec-1994	0407Z
1840.0	9J2GA	17-Dec-1994	0346Z

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1826.1	OM8AU	17-Dec-1994	0339Z
1840.0	4L4KK	17-Dec-1994	0336Z
1831.0	OK2HI	17-Dec-1994	0308Z
1840.0	CU2CE	16-Dec-1994	2353Z
1833.3	SP5GRM	16-Dec-1994	2330Z
1843.0	GU2FRO	16-Dec-1994	0808Z
1821.0	ES5DE	16-Dec-1994	0710Z
1825.8	OZ7YY	16-Dec-1994	0653Z
1827.3	IV3YYK	16-Dec-1994	0642Z
1844.0	S59A	16-Dec-1994	0635Z
1825.8	OS6KD	16-Dec-1994	0633Z
1831.3	SP5GRM	16-Dec-1994	0628Z
1830.5	OZ7YY	16-Dec-1994	0626Z
1827.5	OE5NNN	16-Dec-1994	0616Z
1823.5	ZB2EO	16-Dec-1994	0611Z
1836.5	OS8RD	16-Dec-1994	0606Z
1831.8	UY5BA	16-Dec-1994	0554Z
1831.0	IT9ZGY	16-Dec-1994	0543Z
1832.9	IV3PRK	16-Dec-1994	0545Z
1837.9	OH1XX	16-Dec-1994	0545Z
1835.0	SV8ZS	16-Dec-1994	0535Z
1829.7	S59A	16-Dec-1994	0543Z
1847.0	UX0ZZ	16-Dec-1994	0526Z
1823.2	OM5ZM	16-Dec-1994	0536Z
1832.9	EW3LB	16-Dec-1994	0532Z
1830.7	HA7PF	16-Dec-1994	0519Z
1832.7	US0LX	16-Dec-1994	0508Z
1835.0	ER2GR	16-Dec-1994	0516Z
1834.3	RW3PZ	16-Dec-1994	0500Z
1827.0	OK1AUN	16-Dec-1994	0446Z
1829.6	OM2XW	16-Dec-1994	0426Z
1830.5	4X4NJ	16-Dec-1994	0435Z
1831.0	RZ6HW	16-Dec-1994	0429Z
1829.9	OM2XW	16-Dec-1994	0351Z
1830.8	RZ6HW	16-Dec-1994	0242Z
1835.9	HK7/SM5HV	16-Dec-1994	0215Z
1840.0	4O4D	16-Dec-1994	0048Z
1828.0	A35RK	15-Dec-1994	1342Z
1828.9	GM3POI	14-Dec-1994	0808Z
1834.9	LA4LN	14-Dec-1994	0754Z
1830.1	SM5CTQ	14-Dec-1994	0743Z
1831.3	LA5SAA	14-Dec-1994	0729Z
1829.0	GM3POI	14-Dec-1994	0723Z
1834.3	UT8IM	14-Dec-1994	0528Z
1831.0	UT7IY	14-Dec-1994	0459Z
1830.4	4X4NJ	14-Dec-1994	0414Z
1833.1	RA6WB	14-Dec-1994	0403Z
1832.1	IT9INO	14-Dec-1994	0339Z
1833.2	I2SYB	14-Dec-1994	0317Z
1832.1	LA4LN	13-Dec-1994	2308Z
1835.0	EI5BW	13-Dec-1994	2301Z
1830.8	GM3POI	13-Dec-1994	0121Z
1840.0	CU2CE	13-Dec-1994	0052Z
1850.0	HB9CXZ	12-Dec-1994	0430Z
1831.0	ON4ACG	12-Dec-1994	0359Z
1821.4	SM6MCW	11-Dec-1994	0603Z
1834.7	SV8ZS	11-Dec-1994	0539Z
1842.0	CN8GI	11-Dec-1994	0520Z
1841.0	JW0C	11-Dec-1994	0214Z
1831.8	VQ9SS	10-Dec-1994	2301Z
1836.0	GW0RIM	10-Dec-1994	0741Z
1826.3	GW4HBK	10-Dec-1994	0738Z
1826.1	LA4LN	10-Dec-1994	0732Z
1830.9	OS6KD	10-Dec-1994	0731Z
1833.4	SM6CPY	10-Dec-1994	0725Z
1829.7	OZ2RH	10-Dec-1994	0723Z
1824.4	PA0CLN	10-Dec-1994	0722Z
1832.2	LA5SAA	10-Dec-1994	0717Z
1823.3	ON7PQ	10-Dec-1994	0715Z
1847.4	OZ1LXJ	10-Dec-1994	0710Z
1832.3	EI6NB	10-Dec-1994	0705Z
1829.4	OZ3SDL	10-Dec-1994	0655Z
1832.4	EA6NB	10-Dec-1994	0647Z
1837.1	PA0LOU	10-Dec-1994	0644Z
1841.4	ON4AEK	10-Dec-1994	0641Z
1818.8	LA5SAA	10-Dec-1994	0649Z
1848.2	DL5XU	10-Dec-1994	0636Z
1841.3	ON4AEK	10-Dec-1994	0642Z

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1834.3	PA0LEG	10-Dec-1994	0638Z
1822.9	YL2PQ	10-Dec-1994	0627Z
1835.0	6W6JX	10-Dec-1994	0502Z
1835.0	PA0LEG	10-Dec-1994	0427Z
1827.0	OE5KE	10-Dec-1994	0422Z
1827.8	OK1DOT	10-Dec-1994	0414Z
1832.0	OM5DX	10-Dec-1994	0345Z
1837.2	PY2BW	10-Dec-1994	0323Z
1837.5	HB9FAF	10-Dec-1994	0309Z
1833.3	SP5GRM	10-Dec-1994	0000Z
1827.0	A35RK	9-Dec-1994	1254Z
1840.0	YL1EZ	9-Dec-1994	0603Z
1832.8	LA5SAA	9-Dec-1994	0438Z
1828.9	4X4NJ	9-Dec-1994	0431Z
1826.9	4N7ZZ	9-Dec-1994	0419Z
1836.6	HK4CZE	9-Dec-1994	0003Z
1840.0	UR0ZZ	8-Dec-1994	0423Z
1840.0	D44BS	7-Dec-1994	2239Z
1833.0	9K2MU	7-Dec-1994	2147Z
1845.0	GI3ZTL	7-Dec-1994	0832Z
1840.0	IK1MMJ	7-Dec-1994	0620Z
1849.6	C6A/N4RP	4-Dec-1994	1200Z
1828.8	YL2PQ	4-Dec-1994	0502Z
1823.0	UA9XJF	4-Dec-1994	0420Z
1827.0	A35RK	3-Dec-1994	1418Z
1837.0	5T5JC	2-Dec-1994	2337Z
1831.0	9M8FC	2-Dec-1994	1456Z
1227.0	A22MN	2-Dec-1994	0316Z
1831.6	D44BS	29-Nov-1994	2342Z
1828.9	9G5SX	29-Nov-1994	2337Z
1824.0	VQ9SS	27-Dec-1994	1418Z
1827.0	KH0AM	26-Nov-1994	1342Z
1824.0	VQ9SS	26-Nov-1994	1315Z
1826.0	VS6WO	26-Nov-1994	1255Z
1827.8	HC1OT	26-Nov-1994	1033Z
1837.8	FK8CP	26-Nov-1994	0946Z
1840.6	F6FGZ	26-Nov-1994	0720Z
1817.4	GW3YDX	26-Nov-1994	0717Z
1840.0	HC8N	26-Nov-1994	0717Z
1841.1	PA0LOU	26-Nov-1994	0712Z
1833.4	LA4LN	26-Nov-1994	0652Z
1833.3	SU2MT	26-Nov-1994	2256Z
1825.0	YK0A	25-Nov-1994	0415Z

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3506.1	VP8CQS	21-Dec-1994	0255Z
3795.5	EA9IE	20-Dec-1994	0646Z
3502.3	HA0NAR	20-Dec-1994	0531Z
3790.0	SV1AOZ	20-Dec-1994	0517Z
3787.0	OS5CD	20-Dec-1994	0515Z
3505.0	OS6FT	20-Dec-1994	0446Z
3503.4	YO9AY	20-Dec-1994	0446Z
3785.1	YO5ODE	20-Dec-1994	0340Z
3792.5	UX0FF	19-Dec-1994	2137Z
3795.0	ZL7AMO	19-Dec-1994	1155Z
3799.0	7X2LS	18-Dec-1994	2211Z
3794.0	9M2AX	18-Dec-1994	1428Z
3799.8	ZL7AMO	18-Dec-1994	1106Z
3522.5	RK2FWA	18-Dec-1994	0637Z
3787.5	YO7CJF	18-Dec-1994	0414Z
3790.2	C31MO	18-Dec-1994	0230Z
3797.0	C31SD	17-Dec-1994	2204Z
3503.0	BY1QH	17-Dec-1994	1452Z
3510.7	ZA1AJ	17-Dec-1994	0542Z
3795.1	ZD7WRG	17-Dec-1994	0417Z
3508.4	JT1BR	16-Dec-1994	1512Z
3507.1	3DA0BK	16-Dec-1994	0257Z
3586.0	YO5ODE	16-Dec-1994	0218Z
3789.0	YB3OSE	15-Dec-1994	2213Z
3797.4	C31UA	15-Dec-1994	2158Z
3790.0	9G1MR	15-Dec-1994	2139Z
3508.9	ZL7AMO	15-Dec-1994	1158Z
3511.3	UT2EA	15-Dec-1994	0120Z
3511.1	US0ZZ	15-Dec-1994	0118Z
3508.8	RX6AOI	15-Dec-1994	0116Z
3506.2	PZ1DY	15-Dec-1994	0030Z
3504.9	YL2DX	15-Dec-1994	0000Z